

# Monthly Marine Biotoxin Report

June 2012

Technical Report No. 12-19

## INTRODUCTION:

This report provides a summary of biotoxin activity for the month of June, 2012. Ranges of toxin concentrations are provided for the paralytic shellfish poisoning (PSP) toxins and for domoic acid (DA). Estimates are also provided for the distribution and relative abundance of *Alexandrium*, the dinoflagellate that produces PSP toxins, and *Pseudo-nitzschia*, the diatom that produces domoic acid. Summary information is also provided for any quarantine or health advisory that was in effect during the reporting period.

Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All samples are assayed for PSP toxins; DA analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA); (iv) Please refer to the appropriate figure key for an explanation of the symbols used on the maps.

### Southern California Summary:

#### Paralytic Shellfish Poisoning

*Alexandrium* was not observed at any southern California sampling location (Figure 1) and PSP toxins were not detected in any shellfish samples collected in June (Figure 3).

#### Domoic Acid

*Pseudo-nitzschia* was observed along the  
(Continued on Page 2)

Figure 1. Distribution of toxin-producing phytoplankton in Southern California during June, 2012.

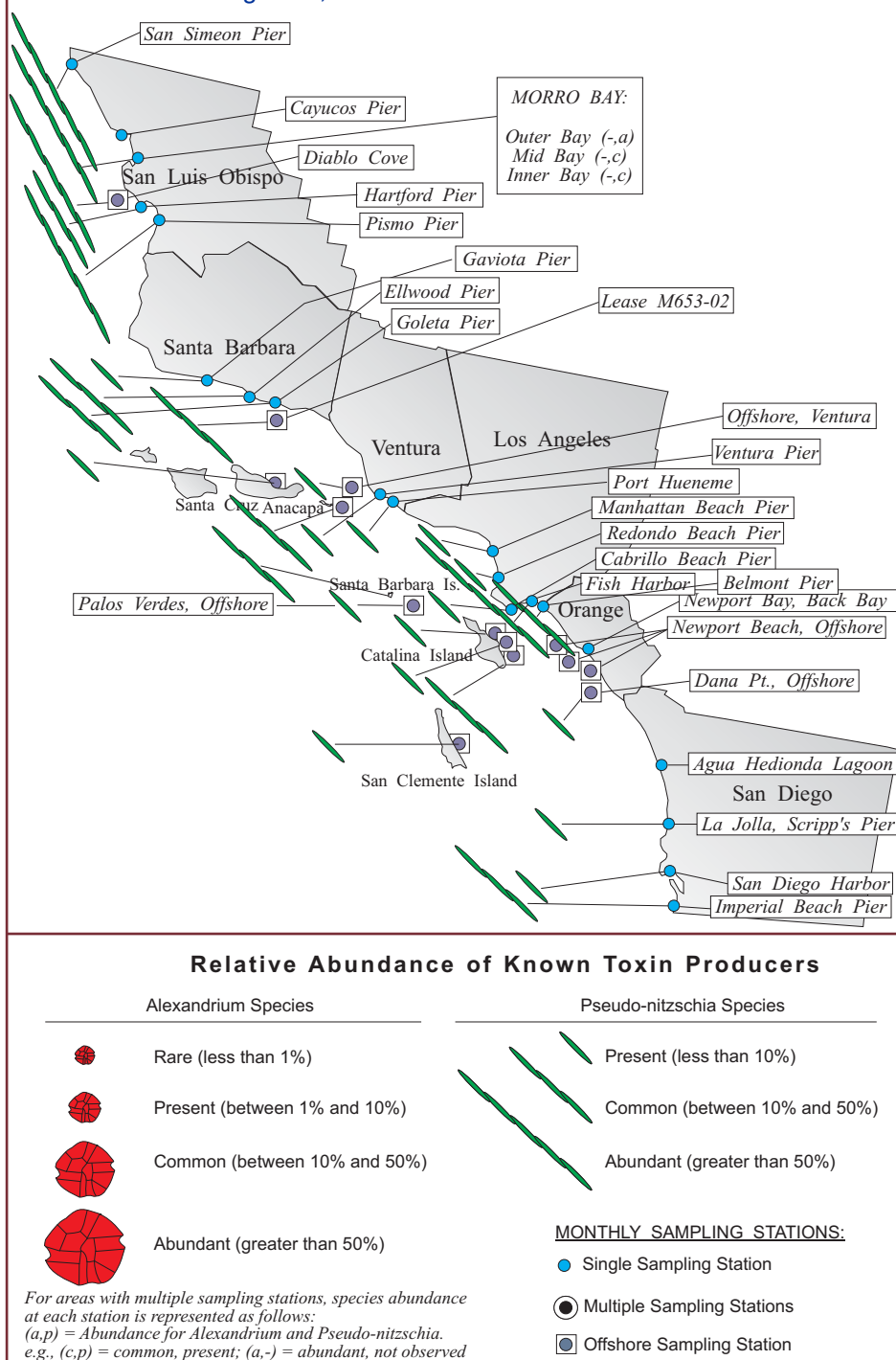
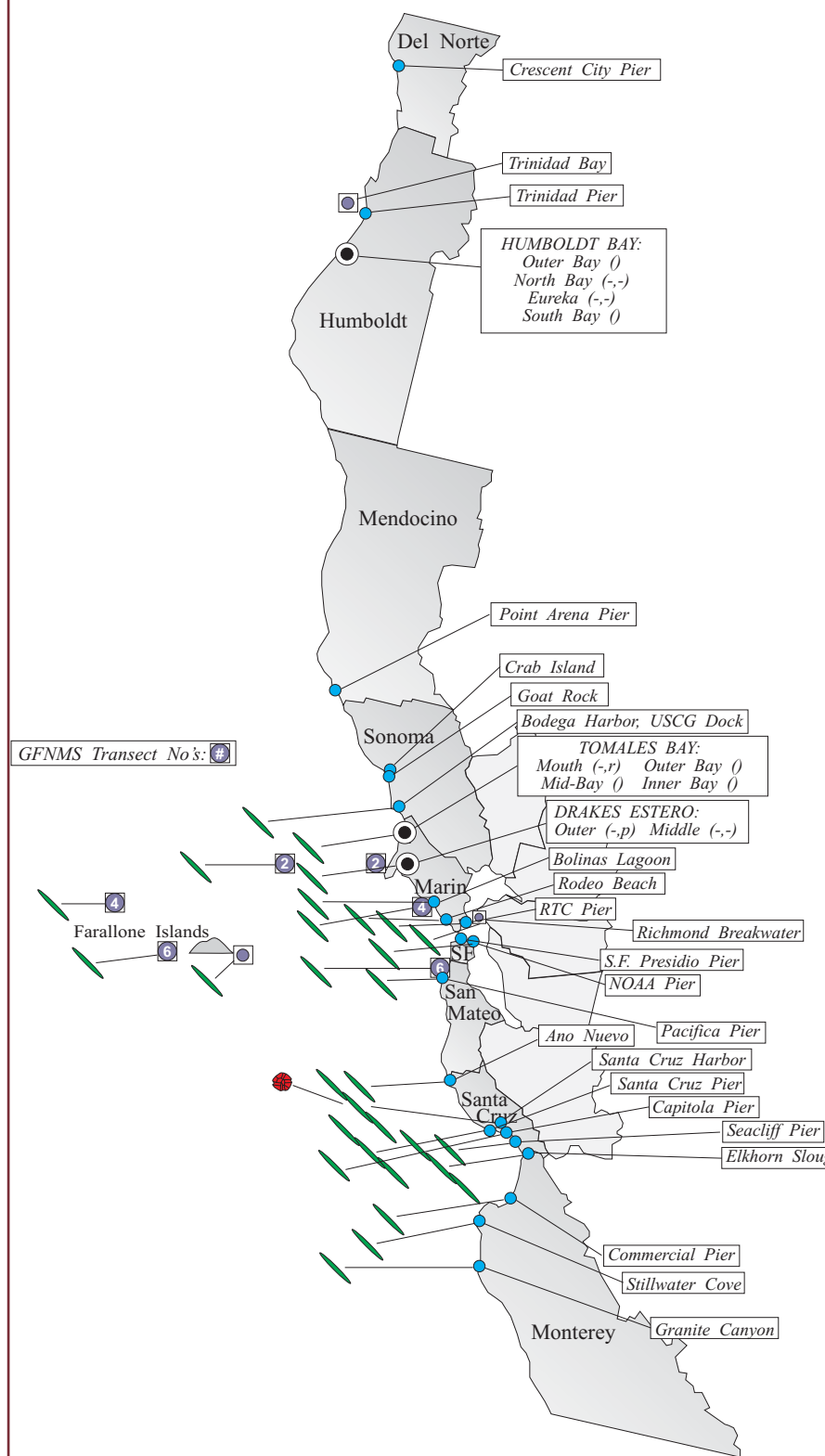


Figure 2. Distribution of toxin-producing phytoplankton in Northern California during June, 2012.



(Continued from Page 1)

entire southern California coast in June (Figure 1). There was a significant increase in relative abundance of this diatom at sites along the San Luis Obispo coast. There was also a significant increase at two locations in the Los Angeles Harbor at Long Beach, however these samples were dominated by the presumed non-toxic delicatissima complex of *Pseudo-nitzschia* species. The overall cell mass of *Pseudo-nitzschia* increased in the areas of greatest relative abundance. The highest relative abundances were observed in outer Morro Bay (June 29), Pismo Pier (June 26), offshore of Diablo Cove (June 19 and 29), and San Simeon Pier (June 22 and 29).

By the third week of June domoic acid was detected in sentinel mussels from outer Morro Bay and in oysters from one of two aquaculture leases farther inside the bay (Figure 3). The toxin level increased above the alert level at the Morro Bay sentinel mussel station by June 25 (31 ppm). Two samples of rock crab collected near Santa Cruz Island contained widely varying concentrations of domoic acid on June 29 (70 ppm and 3.9 ppm).

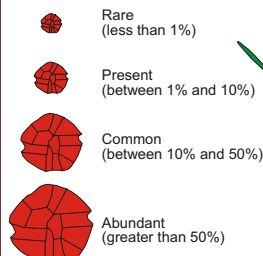
### Non-toxic Species

Diatoms continued to dominate the southern California coast in June. *Chaetoceros* was common to abundant at most sites.

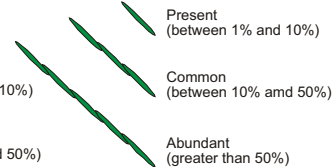
(Continued on Page 3)

### Relative Abundance of Known Toxin Producers

#### Alexandrium Species



#### Pseudo-nitzschia Species



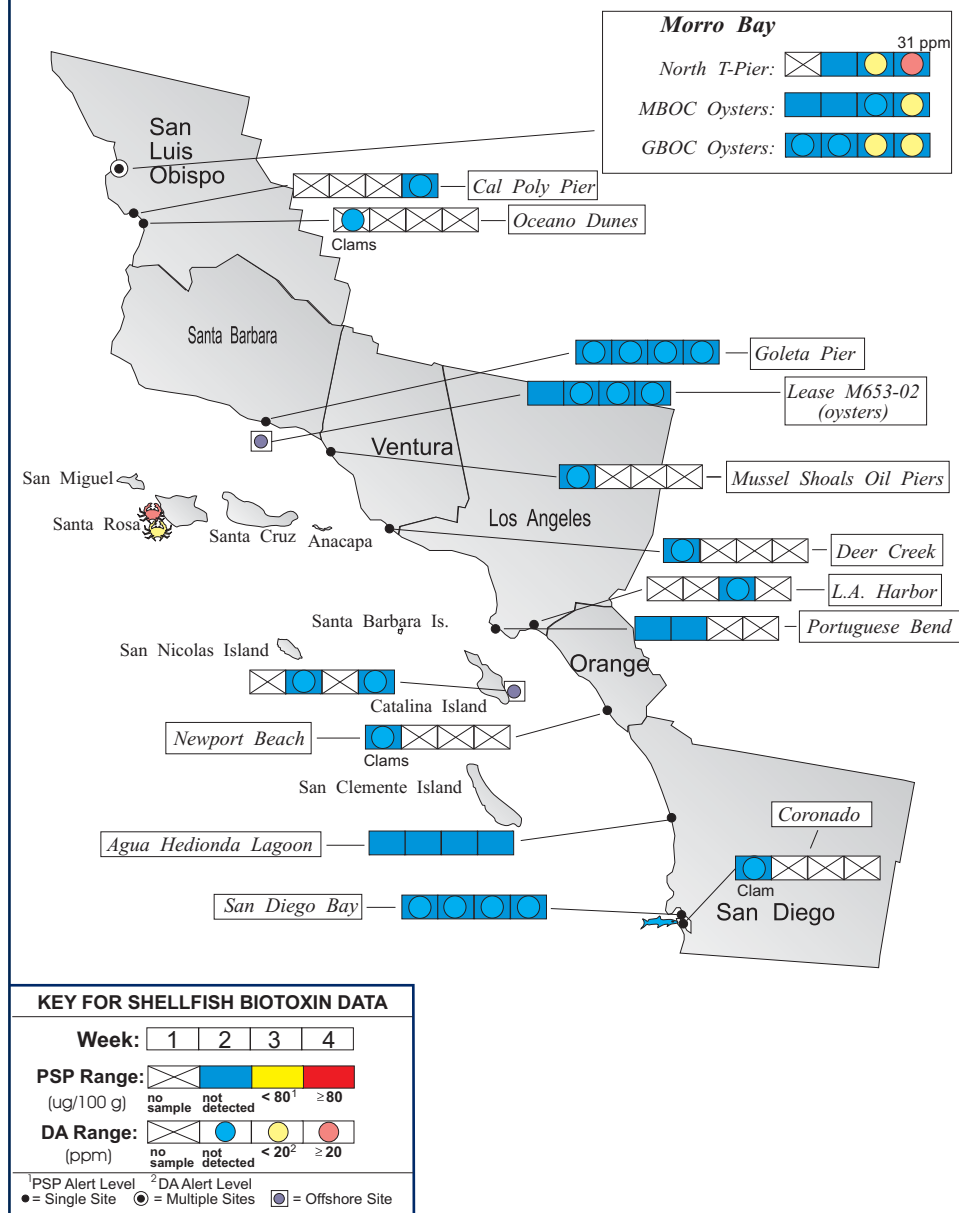
#### MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

For areas with multiple sampling stations, species abundance at each station is represented as follows:

(A,P) = Abundance for *Alexandrium* and *Pseudo-nitzschia*.  
e.g., (c,p) = common, present; (a,-) = abundant, not observed

Figure 3. Distribution of shellfish biotoxins in Southern California during June, 2012.



(Continued from Page 2)

Dinoflagellates, including *Ceratium* and *Prorocentrum*, were common offshore of Palos Verdes (June 14 and 27) and at Scripps Pier (June 5), respectively.

### Northern California Summary:

#### Paralytic Shellfish Poisoning

*Alexandrium* was observed at only one location on June 4 (Figure 2). PSP toxins were not detected in any samples collected in June (Figure 4).

#### Domoic Acid

*Pseudo-nitzschia* was observed at several sites along the northern California coast during June (Figure 2). There was a slight decline in relative abundance at sampling sites in Monterey Bay, however this diatom remained common at some locations. The highest relative abundance was observed in a June 4 sample from Santa Cruz Harbor.

Domoic acid was detected in sentinel mussels from Santa Cruz Pier during the first two weeks of June (3.3 ppm and 3.8 ppm, respectively).

#### Non-toxic Species

Diatoms dominated the northern California coast. *Chaetoceros* was common to abundant at most locations and the highest cell mass observed was at Goat Rock in

The Marine Biotoxin Monitoring and Control Program, managed by the California Department of Public Health, is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins and domoic acid.

The Phytoplankton Monitoring Program is a state-wide effort designed to detect toxin producing species of phytoplankton in ocean water before they impact the public. The phytoplankton monitoring and observation effort can provide an advanced warning of a potential toxic bloom, allowing us to focus sampling efforts in the affected area before California's valuable shellfish resources or the public health is threatened.

For More Information Please Call:  
(510) 412-4635

For Recorded Biotoxin Information Call:  
(800) 553-4133

Sonoma County (June 21 and 29). *Corethron* was abundant in offshore samples collected by the Gulf of the Farallones National Marine Sanctuary.



### QUARANTINES:

The annual mussel quarantine began on May 1. This quarantine prohibits the sport-harvesting of mussels along the entire California coastline, including all bays and estuaries. The annual quarantine does not apply to the certified commercial shellfish growing areas in California, which are monitored intensively throughout the year. In addition, routine coastal phytoplankton and biotoxin monitoring is maintained throughout the quarantine period. Special quarantines or health advisories may be issued for additional seafood species as warranted by increasing toxin levels.

Consumers of Washington clams, also known as butter clams (*Saxidomus nuttalli*), are cautioned to eat only the white meat. Washington clams can concentrate the PSP toxins in the viscera and in the dark parts of the siphon and can remain toxic for a long period of time. Persons taking scallops or clams, with the exception of razor clams, are advised to remove and discard the dark parts (i.e., the digestive organs or viscera). Razor clams (*Siliqua patula*) are an exception to this general guidance due to their ability to concentrate and retain domoic acid in the edible white meat as well as in the viscera.

PSP toxins affect the human central

(Continued on Page 5)

Figure 4. Distribution of shellfish biotoxins in Northern California during June, 2012.

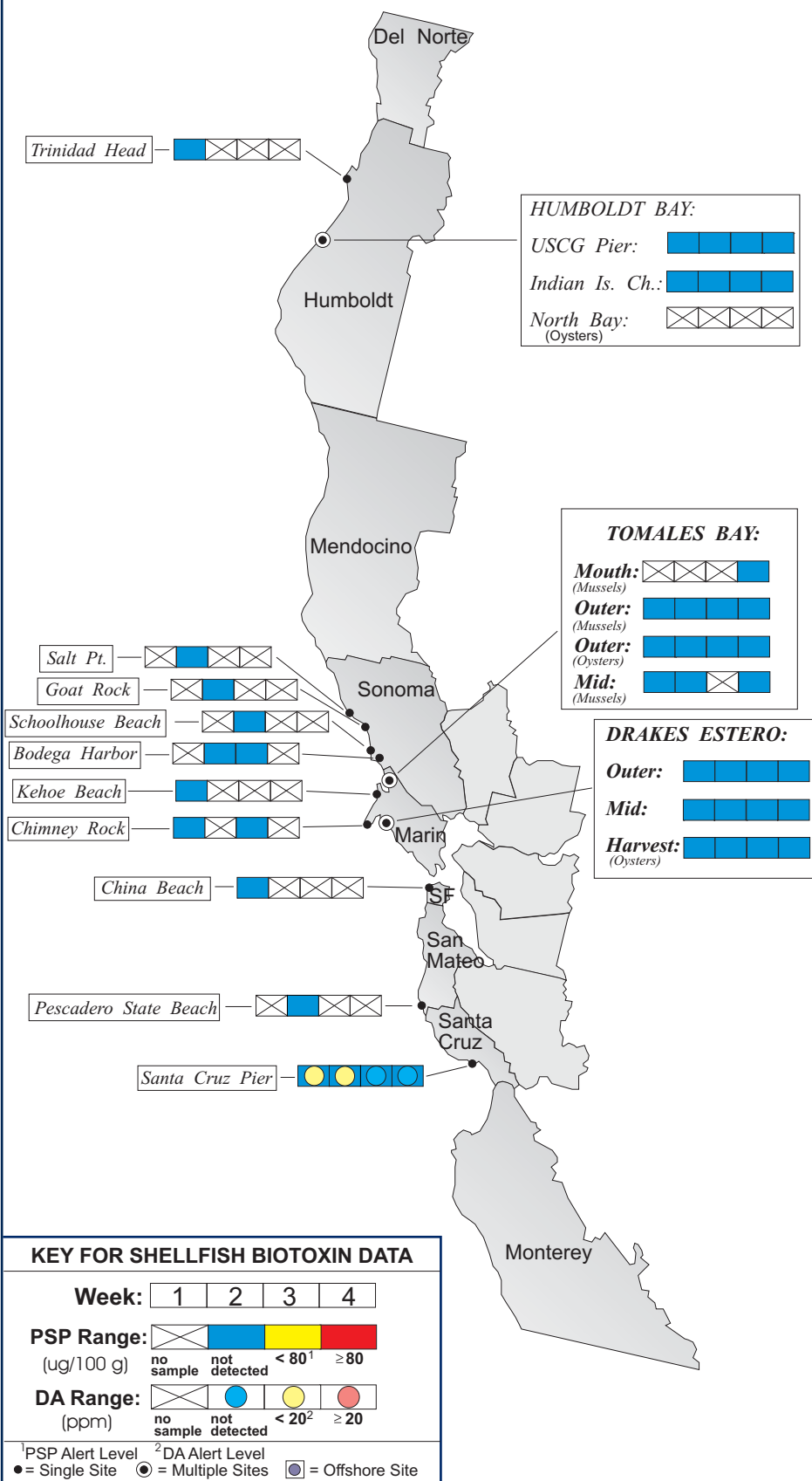


Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during June, 2012.

COUNTY	AGENCY	#
Del Norte	None Submitted	
Humboldt	Coast Seafood Company	7
	Humboldt County Environmental Health Department	1
Mendocino	None Submitted	
Sonoma	CDPH Marine Biotoxin Program	5
Marin	Cove Mussel Company	3
	Drakes Bay Oyster Company	16
	Hog Island Oyster Company	5
	Marin Oyster Company	4
	CDPH Marine Biotoxin Program	3
	CDPH Volunteer ( <i>Chris Starbird</i> )	1
San Francisco	San Francisco Health Department	1
San Mateo	San Mateo County Environmental Health Department	1
Santa Cruz	U.C. Santa Cruz	4
Monterey	None Submitted	
San Luis Obispo	Grassy Bar Oyster Co.	11
	Morro Bay Oyster Company	6
	CDPH Volunteer ( <i>Bryce Halford</i> )	1
Santa Barbara	Santa Barbara Mariculture Company	8
	U.C. Santa Barbara	6
Ventura	Ventura County Environmental Health Department	2
Los Angeles	CDPH Volunteer ( <i>Cal Parsons</i> )	3
	Los Angeles County Health Department	2
Orange	CDPH Volunteer ( <i>Steve Crooke</i> )	1
San Diego	Carlsbad Aquafarms, Inc.	4
	CDPH Volunteer ( <i>Steve Crooke</i> )	1
	U.S. Navy Marine Mammal Program	5

Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during June, 2012.

COUNTY	AGENCY	#
Del Norte	Del Norte County Health Department	4
Humboldt	Coast Seafood Company	4
	Humboldt State University Marine Lab	5
Mendocino	CDPH Volunteer ( <i>Marie de Santis</i> )	2
Sonoma	CDPH Marine Biotoxin Program	2
	WaterTreks EcoTours	7
Marin	Drakes Bay Oyster Company	12
	CDPH Volunteer ( <i>Brent Anderson</i> )	4
	SFSU, Romberg Tiburon Center	4
	CDPH Marine Biotoxin Program	3

(Continued from Page 4)

nervous system, producing a tingling around the mouth and fingertips within a few minutes to a few hours after eating toxic shellfish. These symptoms typically are followed by disturbed balance, lack of muscular coordination, slurred speech and difficulty swallowing. In severe poisonings, complete muscular paralysis and death from asphyxiation can occur.

Symptoms of domoic acid poisoning can occur within 30 minutes to 24 hours after eating toxic seafood. In mild cases, symptoms of exposure to this nerve toxin may include vomiting, diarrhea, abdominal cramps, headache and dizziness. These symptoms disappear completely within several days. In severe cases, the victim may experience excessive bronchial secretions, difficulty breathing, confusion, disorientation, cardiovascular instability, seizures, permanent loss of short-term memory, coma and death.

Any person experiencing any of these symptoms should seek immediate medical care. Consumers are also advised that neither cooking or freezing eliminates domoic acid or the PSP toxins from the shellfish tissue. These toxins may also accumulate in the viscera of other seafood species such as crab, lobster, and small finfish like sardines and anchovies, therefore these tissues should not be consumed. Contact the "Biotoxin Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity prior to gathering and consuming shellfish.



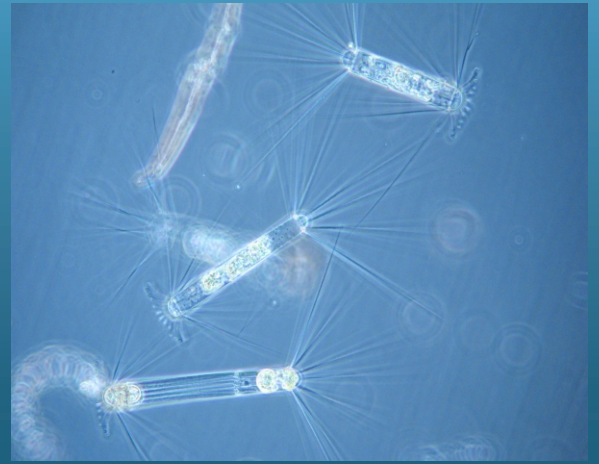
(Continued on Page 6)



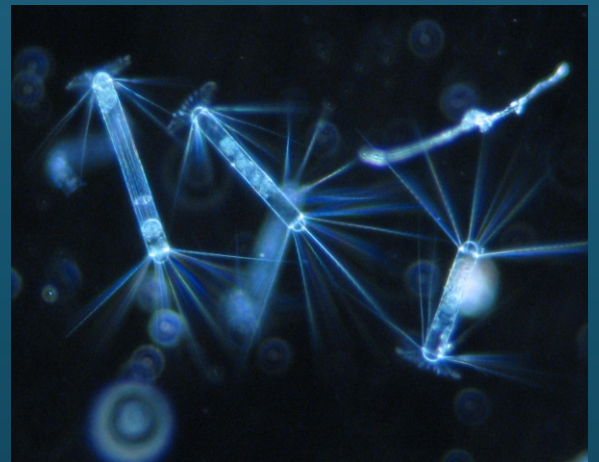
(Continued from Page 5)

Marin (cont.)	Applied California Current Ecosystem Studies (ACCESS)	12
	Golden Gate National Recreation Area	2
Contra Costa	CDPH Marine Biotoxin Program	1
Alameda	None Submitted	2
San Francisco	CDPH Volunteer ( <i>Eugenia McNaughton</i> )	1
	Exploratorium	3
	ACCESS	3
	San Francisco Bay Whale Watching Company	2
San Mateo	The Marine Mammal Center ( <i>Stan Jensen</i> )	4
	San Mateo County Environmental Health Department	1
	U.C. Santa Cruz	1
Santa Cruz	San Lorenzo Valley High School	2
	CDPH Marine Biotoxin Program	1
	U.C. Santa Cruz	4
	Santa Cruz County Environmental Health Department	3
Monterey	Friends of the Sea Otter ( <i>Janis Chaffin, Cory Utter</i> )	6
	Monterey Abalone Company	3
	Marine Pollution Studies Laboratory	3
San Luis Obispo	Friends of the Sea Otter ( <i>Kelly Cherry, Al Guild</i> )	4
	Grassy Bar Oyster Company	4
	Morro Bay National Estuary Program	2
	Monterey Bay National Marine Sanctuary	5
	Tenera Environmental	4
	The Marine Mammal Center ( <i>P.J. Webb, Tim Lytsell</i> )	3
Santa Barbara	CDPH Volunteer ( <i>Sylvia Short</i> )	4
	Santa Barbara Mariculture Company	4
	U.C. Santa Barbara	4
	Tole Mour	1
	CDPH Marine Biotoxin Program	1
Ventura	CDPH Volunteer ( <i>Fred Burgess</i> )	4
	National Park Service	2
	Ventura County Environmental Health Department	1
	Channel Island National Marine Sanctuary	1
Los Angeles	Los Angeles County Sanitation District	3
	CDPH Volunteer ( <i>Cal and Sadie Parsons</i> )	3
	Los Angeles County Health Department	3
	Tole Mour	5
	Southern California Marine Institute	1
	Long Beach Marine Institute	1
Orange	Orange County Sanitation District	3
	California Department of Fish and Game	4
	Ocean Institute	1
San Diego	Carlsbad Aquafarms, Inc.	1
	Scripps Institute of Oceanography	4
	Tijuana River National Estuary Research Reserve	4
	U.S. Navy Marine Mammal Program	4

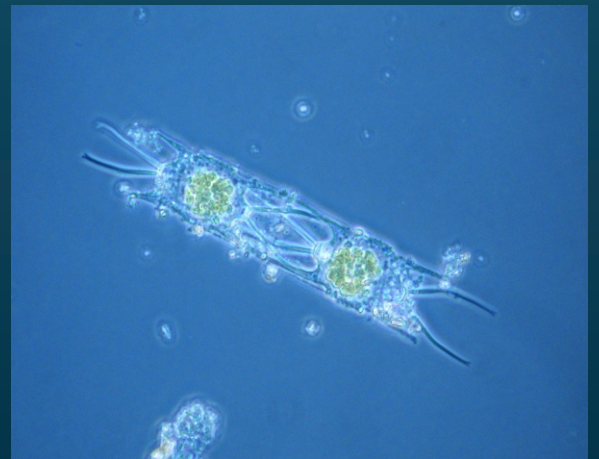
## PHYTOPLANKTON GALLERY



The diatom *Corethron* was abundant only in samples offshore of Marin County.



A 'dark field' image of *Corethron* that illustrates the elegant and complex structure of this diatom.



*Odontella*, another diatom with an intricate cell structure visible with basic light microscopy.